

Claims

1. Isolated DNA fragment comprising the nucleotide sequence SEQ ID No. 8.
- 5 2. Isolated DNA fragment encoding the amino acid sequence SEQ ID No. 9.
3. Isolated DNA fragment having the nucleotide sequence SEQ ID No. 8.
4. DNA fragment according to claim 1, combined, in the 10 form of a fusion, with the nucleotide sequence encoding at least one immunogen or at least one immunologically active fragment of an immunogen, in particular an equine immunogen.
5. Isolated equine GM-CSF polypeptide.
- 15 6. Isolated equine GM-CSF polypeptide having the amino acid sequence SEQ ID No. 9.
7. Fusion protein encoded by a fragment according to claim 4.
8. *In vitro* expression system comprising as insert and 20 expressing *in vitro* a DNA fragment according to claim 1.
9. *In vivo* expression vector comprising a DNA fragment according to claim 1, under conditions allowing the expression, in horses, of a functional equine GM-CSF protein.
- 25 10. Vector according to claim 9, the vector being a plasmid.
11. Vector according to claim 9, the vector being a viral vector.
12. Vector according to claim 11, the viral vector 30 being selected from the group consisting of poxvirus, adenovirus and herpesvirus.
13. Vector according to claim 12, the poxvirus being selected from the group consisting of vaccinia, canarypox, fowlpox, swinepox, raccoonpox and camelpox

viruses.

14. Immunogenic composition or equine vaccine, comprising the equine GM-CSF protein, an immunogenic or vaccinal preparation against an equine pathogen and a 5 veterinarianily acceptable excipient or vehicle.
15. Composition or vaccine according to claim 14, in which the immunogenic or vaccinal preparation is selected from the group consisting of inactivated, attenuated live, subunit and recombinant preparations.
- 10 16. Immunogenic composition or equine vaccine, comprising an *in vivo* expression vector according to one of claims 9 to 13, an immunogenic or vaccinal preparation against an equine pathogen and a veterinarianily acceptable excipient or vehicle.
- 15 17. Composition or vaccine according to claim 16, in which the immunogenic or vaccinal preparation is selected from the group consisting of inactivated, attenuated live, subunit and recombinant preparations.
- 20 18. Immunogenic composition or equine vaccine, comprising a plasmid expressing an equine GM-CSF protein, a plasmid expressing an equine pathogen immunogen and a veterinarianily acceptable vehicle or excipient.
- 25 18. Nonspecific stimulating composition, comprising the equine GM-CSF protein and a veterinarianily acceptable excipient or vehicle.
19. Nonspecific stimulating composition, comprising an *in vivo* expression vector according to one of claims 9 to 13 and a veterinarianily acceptable excipient or vehicle.